CLAIMS

1. A method for deinterlacing a picture, comprising the steps of:

(A) calculating a plurality of differences among a plurality of current samples from a current field of said picture, said differences being calculated along a plurality of line segments at a plurality of angles proximate a particular position between two field lines from said current filed;

(B) generating a first sample at said particular position by vertical filtering said current field in response to said differences indicating that said particular position is a non-edge position in said picture; and

(C) generating a second sample at said particular position by directional filtering said current field in response to said differences indicating that said particular position is an edge position in said picture.

2. The method according to claim 1, further comprising the step of:

checking said second sample against a plurality of neighbor current samples from said current field proximate to said second sample.

3. The method according to claim 2, further comprising the step of:

adding said second sample to said current field in response to said checking indicating that said interpolated sample is similar to said neighbor current samples.

4. The method according to claim 2, wherein step (B) is performed in further response to said checking indicating that said second sample is dissimilar to said neighbor current samples.

5. The method according to claim 4, further comprising the step of:

blending said first sample with a third sample from said particular position in a neighboring field of said picture.

6. The method according to claim 1, wherein said angles comprise a plurality of first angles between 0 and 90 degrees noninclusive and a plurality of second angles between said 90 degrees and 180 degrees noninclusive relative to a horizontal axis through said particular position.

7. The method according to claim 1, further comprising the step of:

generating a plurality of pad samples beyond a boundary of said current field to supplement said current samples in generating said differences.

8. The method according to claim 1, further comprising the step of:

adding a third sample from said particular position in a previous field of said picture to said current field in response a first determination to deinterlace only by temporal filtering.

9. The method according to claim 8, further comprising the step of:

generating a fourth sample at said particular position in response to a second determination to deinterlace only by vertical filtering.

10. The method according to claim 9, further comprising the steps of:

generating a plurality of pad samples beyond a boundary of said current field to supplement said current samples;

checking said second sample against a plurality of neighbor current samples from said current field vertically adjacent to said second sample;

adding said second sample to said current field in response to said checking indicating that said second sample is similar to said neighbor current samples;

generating a fifth sample by blending said first sample with said third sample in response to said checking indicating that said second sample is dissimilar to said neighbor current samples; and

adding said third sample to said current field.

11. A method for format conversion, comprising the steps of:

(A) reading a first field and a second field from a memory;

(B) generating a plurality of directional estimations based on said first field for a plurality of interpolated samples to be added into said first field to form a frame; and

(C) generating said interpolated samples using (i) temporal filtering based on said first field and said second field, (ii) vertical spatial filtering based on said first field and (iii) spatial directional filtering based on said directional estimations and said first field.

12. The method according to claim 11, wherein step (C) comprises the sub-step of:

generating said interpolated samples using at least one of (i) adaptive switching at a frame level, (ii) adaptive switching at a pixel level, (iii) nonadaptive switching at said frame level,

(iv) nonadaptive switching at said pixel level and (v) blending of said temporal filtering and said spatial filtering.

13. The method according to claim 11, further comprising the step of:

performing at least one of a horizontal stationary edge check and a stationary pixel check based on a third field read from said memory.

14. The method according to claim 11, further comprising the step of:

motion compensating said second field prior to generating said interpolated samples.

15. The method according to claim 11, further comprising the step of:

vertical spatial filtering said second field prior to generating said interpolated samples.

16. The method according to claim 11, further comprising the steps of:

vertical spatial filtering said second field; and

motion compensating said second field prior to generating said interpolated samples.

17. The method according to claim 11, wherein generating said directional estimations uses at least one of (i) a horizontal window having no greater than four field lines of said first field to estimate a present and direction of a high contrast edge, (ii) a plurality of samples from said second field each having a reduced bit-depth, (iii) a plurality of moving averages of directional sample difference metrics.

18. The method according to claim 17, wherein step (C) comprises the sub-step of:

generating said interpolated samples using at least one of (i) adaptive pixel level switching, (ii) nonadaptive pixel level switching and (iii) blending.

19. The method according to claim 11, wherein each of said first field and said second field consist of a plurality of luminance samples.

20. An apparatus comprising:

means for storing a first field and a second field;

means for vertical spatial filtering said second field;

means for generating a plurality of directional estimations based on said first field for a plurality of interpolated samples to be added into said first field to form a frame; and

means for generating said interpolated samples using (i) temporal filtering based on said first field and said second field after said vertical spatial filtering and (ii) vertical spatial filtering based on said first field.